United States Department of Agriculture

Stillwater Pasture Renovation Project – Site D, Year 1

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County: Stillwater
Average annual precip: 15”
MLRA: 58A, Northern rolling plains
Dominant Soil Type: Lonna Silt Loam
Acres: 62
Planting Date: May 25, 2019
Seeding Rate: 483,418 seeds/ac = 11 seeds/ft^2 = 29 lb/ac
Seed cost: $31.72/acre (inoculant, and seed)
Seeding Method: No-till air drill, double disc
Row Spacing: 7.5”
Tillage: No-till
Previous Crop and Year: Crested wheatgrass
Herbicides: 32 oz glyphosate, May 15th
Post-emergence: None
Insecticides/Fungicides: None
Fertilizer: None
Irrigation: Dryland
Termination Date: Fall
Termination Method: Grazing and frost
Next Crop: Annual mixed cover crop, spring 2020

Fig. 1. Mixed cover crop and grazing, August 23, 2019. Density is lighter because cows have already gone through.

Table 1. Monthly precipitation at Columbus, MT. Western Regional Climate Center, station #241938.

Columbus	J	F	M	A	M	J	J	A	S	O	N	D	Total
30 yr avg 1989-2019	0.61	0.67	1.08	1.85	2.69	2.27	1.18	0.93	1.31	0.93	0.64	0.57	14.99
2018	0.85	1.51	0.65	2.48	5.82	2.56	1.15	1.25	0.77	0.88	0.69	0.43	19.04
2019	0.59	1.45	0.51	2.83	3.60	2.65	2.88	0.72	5.01	1.87	0.73	0.14	22.98

Introduction:

Multiple pastures in Stillwater County are being converted from crested or intermediate wheatgrass monoculture to a more diverse perennial forage mix. Crested wheatgrass is killed with herbicide in the spring of Year 1. Annual cover crops are grown and grazed for two years to provide forage, allow for adequate kill of the crested wheatgrass, and to provide soil health benefits. Diverse perennial pasture mixes will be seeded in Year 3. This report gives results of Site D after the first year of annual cover crops. It should be noted that 2019 was a wet year, with close to 23 inches of total precipitation in Stillwater County, or 8 inches more than the 30-yr normal.

Results:

This site was sprayed with 32 oz/acre of glyphosate on May 15 to kill existing pasture species. This producer seeded a mixed species cover crop on May 25 and the cover crop was sampled on August 23 with three hoop clippings. Biomass was air-dried before weighing. Total aboveground biomass after air drying was 3816 lb/acre, or 1.9 ton/acre. There were 2111 Growing Degree Days (base 40) from seeding to sampling. Assuming 910 lbs of forage per animal month and 50% utilization rate on 62 acres, there were 130 AUMs available in this field.

Table 2. Annual cover crop mix seeded at Site D, May 25, 2019.

Cover Crop Species	Seeding Rate (lb/ac)	Percentage of mix
Field Pea	10	4
Soybean	6	6
Pearl Millet	1.5	26
Sorghum-sudangrass	6	21
Spring Barley	3	7
Forage Collards	0.5	18
Turnip	0.25	13
Sunflower	2	5
TOTAL	29.25	100

Summary and Discussion:

This pasture was a relatively weed-free stand of crested wheatgrass prior to renovation. Cattle were fed on this field in the winter of 2018. AS a result, the field had noticeable green strips where the bales had been rolled out.

The crested wheatgrass killed very well after spraying, and the cover crop grew incredibly well. We were very happy with the stand density and diversity. Due to prior feeding of cattle, this field seemed to have better fertility than others in the project. In the future, however, the producer plans to apply some fertilizer to aid in nutrient cycling. The producer is so pleased with the mix he plans to use it for Year 2 but might increase the sorghum-sudan and decrease the sunflower in the mix.

This mix worked as a great pollinator attractant. Each sunflower in the field had multiple bees feeding on it. During the August site visit, the field was loud with a noticeable buzzing sound.

This site was located further north in the county, and did not suffer from grasshopper damage like sites A, B, and C.

Fig. 2. Cover crop on July 25, 2019 (l) and August 23, 2019 (c) and (r). Notice the three bumblebees on the sunflower.

https://www.nrcs.usda.gov/wps/portal/nrcs/mt/soils/health/